Data Use and Complexity in Coastal Climate Adaptation and Planning

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Data Use and Complexity in Coastal Climate Adaptation and Planning

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Climate research advances our knowledge of current and future sea level changes at global and regional scales[1,2], extreme water levels[3], natural variability and anthropogenic footprint in sea level[4], and of methods to evaluate sea level change from satellite[5] and tide gauge data[6,7]. Future impact from erosion, floods and inundation to people and the environment in coastal regions is substantial[8, 9]. Still, for several reasons gaps exist between scientific knowledge and actual measures to mitigate climate change effects: the communication of uncertainty in projections is not a 'one size fits all'; the translation of climate change evidence to concrete impact measures is difficult; different agendas and opinions exist across levels of governance; and politics and economy matter. Climate research budget cuts in Denmark and elsewhere challenge the ways we perceive, address, and act on climate change issues in society.
Based on a Danish case study, starting out from future storm surge impact, we investigate how climate change interacts with other factors to reveal a broader platform and perspective for municipal climate change adaptation. This includes the use of existing and new in situ and satellite data, and different local stakeholder standpoints and knowledge. Adaptation to future coastal floods then becomes an integral part of urban and environmental planning and is not solely addressed as a climate change issue. Conceptually, this provides the municipality with a simple framework for decision-making in relation to water related challenges that is cost-effective, provides better solutions, and accommodates current municipal legislation, planning, and service levels. To advance sound management solutions the involved stakeholders must, however, acknowledge that a common gain is achieved only through collaboration and a shared appraisal of potential actions. Easy access to earth observation satellite data and services will greatly benefit municipal work and an enhanced national focus on the development of such services is advocated.

1: IPCC, 2013. WGIAR5 doi:10.1017/CBO9781107415324 **2**: Grinsted et al., 2015. *Clim. Res.*, doi:10.3354/cr01309 **3**: Arns et al., 2015. *Coast. Eng.*, doi:10.1016/j.coastaleng.2014.12.002 **4**: Dangendorf et al., 2015. *Nat. Commun.*, doi:10.1038/ncomms8849 **5**: Nerem et al., 2010. *Mar. Geol.*, doi:10.1080/01490419.2010.491031 **6**: Wahl et al., 2013. *Earth Sci. Rev.*, doi:10.1016/j.earscirev.2013.05.003 **7**: Visser et al., 2015: *J. Geophys. Res. Oceans*, doi:10.1002/2015JC010716 8: Cramer et al., 2014, WGIIAR5,Ch.18 **9**: IPCC, 2012. ipcc-wg2.gov/SREX.